Continuation of U.S.S.N. 09/298,084
Filed: May 3, 2001
AMENDMENTS PURSUANT TO 37 C.F.R. § 1.121

Clean Version of Amended Claims

Pursuant to 37 C.F.R. § 1.121(c)(1)(ii)

1. (Amended) A drug delivery composition comprising:

a substrate;

a peptide comprising a domain that binds heparin or heparin-like compounds with high affinity affinity,

wherein the peptide is covalently bound to the substrate so that the heparin binding domain is able to bind to heparin or heparin-like compounds;

heparin or a heparin-like polymer; and

a protein growth factor or a peptide fragment thereof having a domain that binds heparin with low affinity, wherein low affinity is defined as not binding with heparin at a NaCl concentration of between about 25 mM and 140 mM.

Please cancel claim 2.

3. ~~(Three times Amended)~~ The composition of claim 1 wherein the domain of the growth factor or peptide fragment thereof is further defined as comprising a length of about 8 to 30 amino acid residues comprising at least 2 basic amino acid residues, a ratio of basic to acidic amino acid residues of at least 2, and a ratio of hydrophobic amino acid residues to basic amino acid residues of at least 0.67.

4. (Amended) The composition of claim 3 wherein the basic amino acid residues are K or R.

5. (Amended) The composition of claim 3 wherein the acidic amino acid residues are further defined as D or E.

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6. (Amended) The composition of claim 3 wherein the hydrophobic amino acid residues are further defined as A, V, F, P, M, I, or L or C when C is involved in a disulfide bond.

7. ~~(Three times Amended)~~ The composition of claim 1 wherein the growth factor or peptide fragment thereof is selected from the group consisting of neurturin, persephin, IGF-1A, IGF-1β, EGF, NGFβ, NT-3, BDNF, NT-4, TGF-β3, and TGF-β4.

20. (Amended) The composition of claim 66 wherein the substrate comprises fibrin.

21. (Amended) The composition of claim 66 wherein the substrate comprises a synthetic polymer hydrogel.

24. (Amended) The composition of claim 64 wherein the heparin or heparin-like polymer has a molecular weight between about 3,000 and 10,000,000 Daltons.

25. (Amended) The composition of claim 64 wherein the heparin-like polymer is a polysaccharide having a molecular weight between about 3,000 and 10,000,000 Daltons, and having at least one negative charge per two saccharide rings and no more than one positive charge per ten saccharide rings.

26. (Amended) The composition of claim 64 wherein the heparin-like polymer is selected from the group consisting of dextran sulfate, chondroitin sulfate, heparin sulfate, fucan, alginate, and a derivative thereof.

27. ~~(Three times Amended)~~ The composition of claim 1 wherein the molar ratio of heparin or heparin-like polymer to growth factor or peptide fragment thereof is at least one.

57. (Amended) The composition of claim 1 in a vascular graft.

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58. (Amended) The composition of claim 1 in an article for treatment of dermal wounds.

59. (amended) The composition of claim 58, wherein the growth factor is ~~TGF~~-β.

61. (Amended) The composition of claim 1 in an implantable sterilized composition.

62. (Amended) A method for providing controlled release of a growth factor comprising:

preparing a composition comprising

a substrate,

a peptide comprising a domain that binds heparin or heparin-like compounds, wherein the peptide is covalently bound to the substrate so that the heparin binding domain is able to bind to heparin or heparin-like compounds,

heparin or a heparin-like polymer, and

a growth factor or a peptide fragment thereof having a domain with low affinity for binding heparin and bound heparin or heparin-like polymer, wherein low affinity is defined as not binding with heparin at a NaCl concentration of between about 25 mM and 140 mM; and

placing the composition on a wound in need thereof.

63. (Amended) The method of claim 62, wherein the growth factor or a peptide fragment thereof is released by dissociation of the growth factor from the heparin or heparin-like polymer.

64. The composition of Claim 1, wherein the heparin or heparin-like compound is non-covalently attached to the peptide.

65. The composition of Claim 1 wherein the substrate is selected from the group comprising fibrin, collagen and synthetic polymer hydrogels.